

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 6676

CSAH NO. 25

OVER THE

RED RIVER OF THE NORTH

DISTRICT 2 - NORMAN COUNTY



PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 42)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge No. 6676, Pier 2, was in good condition with no structurally significant defects observed. At the time of the inspection, the channel was partially restricted by a moderate accumulation of timber debris in and around numerous abandoned timber piles cut-off just above the waterline in the eastern portion of the channel. The channel bottom appeared stable with no significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

- (A) Adjacent to Pier 2 and extending towards the east bank, a moderate accumulation of timber debris consisting of large tree branches and logs up to 1 foot in diameter was present, extending from 1 foot above the waterline to the channel bottom. The accumulation extended to across the upstream nose of Pier 2 and along most of the easterly side of the shaft.
- (B) Numerous abandoned timber piles were present along the eastern shoreline. Most of these piles were cut-off approximately 3 feet above the waterline, and were trapping timber drift and causing it to accumulate.
- (C) The east bank was heavily eroded upstream and downstream of the bridge.

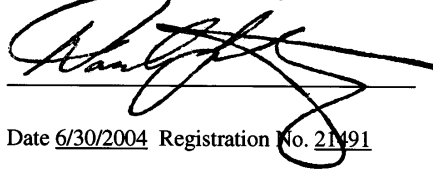
RECOMMENDATIONS:

- (A) Ideally, the moderate accumulation of timber debris located around Pier 2 and the abandoned timber piles should be removed. In addition, consideration could be given to cutting down the abandoned piles to prevent future accumulations. Until removal operations are accomplished, future inspections should particularly monitor the drift accumulations.

- (B) Design plans with footing information for Pier 2 should be obtained, if possible, for the next underwater inspection.
- (C) Reinspect the submerged substructure unit at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

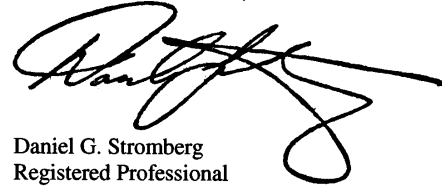
Daniel G. Stromberg



Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 6676

Feature Crossed: The Red River of the North

Feature Carried: CSAH No. 25

Location: District 2 - Norman County

Bridge Description: The two main spans consist of steel through trusses and the two approach spans consist of multiple steel beams. The substructure includes two reinforced concrete abutments and three reinforced concrete piers. The piers are numbered 1 through 3 starting from the west end of the structure. Both abutments and Piers 1 and 3 are supported on footings founded on steel H-piles. The drawings furnished did not indicate the foundation type of Pier 2.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Clayton G. Brookins, Michelle D. Koerbel

Date: October 28, 2002

Weather Conditions: Rain and Snow, $\pm 35^{\circ}$ F

Underwater Visibility: ± 0.5 Feet

Waterway Velocity: ± 3 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 2

General Shape: The pier consists of two primary, multi-sided columns connected with a full height, solid shaft web wall. As previously indicated, no foundation information for Pier 2 was furnished.

Maximum Water Depth at Substructure Inspected: Approximately 7.0 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the downstream end of Pier 2.

Water Surface: The waterline was approximately 33.7 feet below reference.
Waterline Elevation = 836.1.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 5

Item 92B: Underwater Inspection: Code B/10/28

Item 113: Scour Critical Bridges: Code I/94

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes X No

GENERAL NOTES:

- Pier 2 was inspected underwater.
- At the time of inspection on October 28, 2002, the waterline was located approximately 33.7 feet below the top of the pier cap at the downstream end of Pier 2. This corresponds with a waterline elevation of 836.1 based on the previous report dated September 8, 1997.
- Soundings indicate the water depth at the time of inspection and are measured in feet.
- Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

- The channel bottom material consisted of silt and gravel with 6 inches of maximum probe rod penetration.
- The channel bottom material consisted of clayey silt with 12 inches of maximum probe rod penetration.
- The channel bottom material at the upstream nose of the pier consisted of hard clay with 2 to 4 inches of maximum probe rod penetration.
- The concrete surfaces of the pier were sound and in good condition with no significant defects observed.
- An abandoned timber pile was observed 2 feet north of the downstream nose of Pier 2, extending from 1 foot below the waterline into the channel bottom.
- Heavy bank erosion was located along the eastern shoreline, upstream and downstream of the bridge, exhibiting 10 foot vertical banks, loss of soil, and exposed tree roots.
- Abandoned timber piles cut off approximately 3 feet above the waterline with scattered accumulated timber drift, with pieces up to 1 foot in diameter, throughout.
- Timber debris consisting of 8 to 10 inch diameter branches was observed at the upstream nose of the pier, along the entire east face of the pier shaft, and around the downstream nose, extending from the channel bottom up to the waterline.
- A log, 1.5 feet in diameter, extended along the west face of the pier shaft on the channel bottom.
- A 2 foot diameter log was observed extending out of the channel bottom to 2 feet above the waterline on the upstream east side of the pier shaft.

Legend

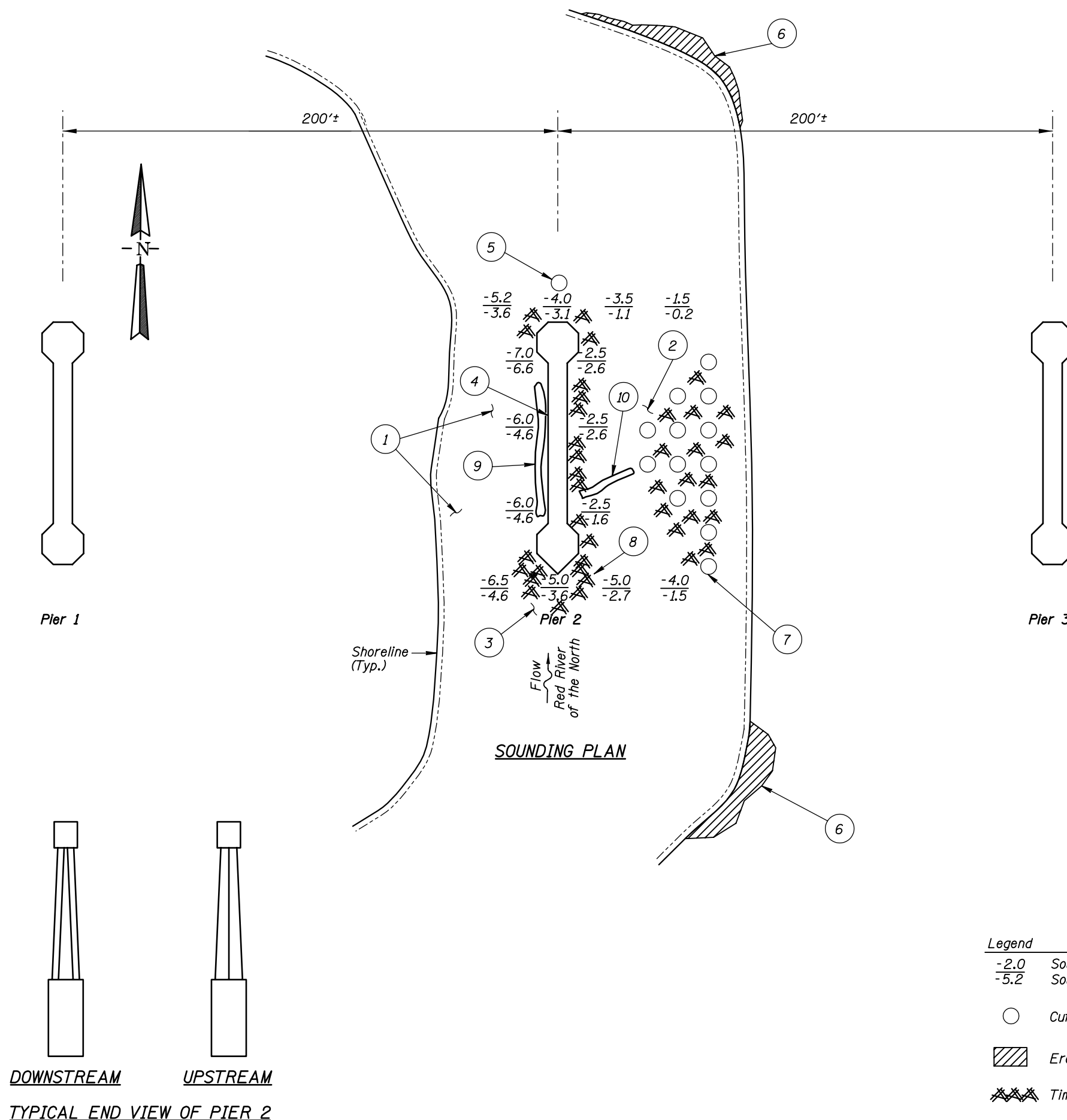
- 2.0 Sounding Depth from Waterline (10/28/02)
-5.2 Sounding Depth from Waterline (9/8/97)
- Cut Off Pile
- ▨ Erosion
- XXX Timber Debris

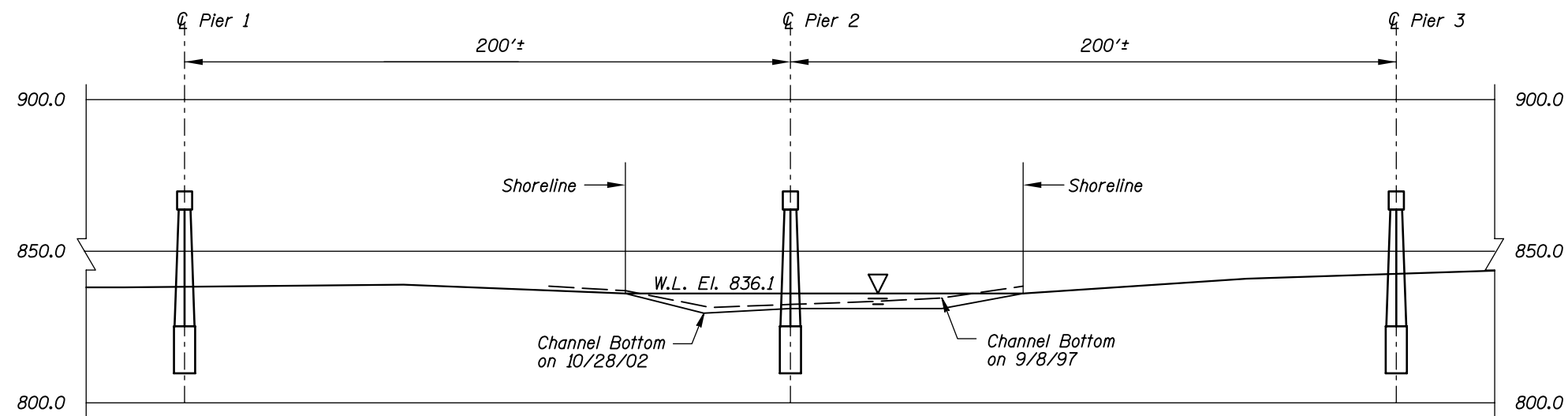
MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 6676
OVER THE RED RIVER OF THE NORTH
DISTRICT 2, NORMAN COUNTY

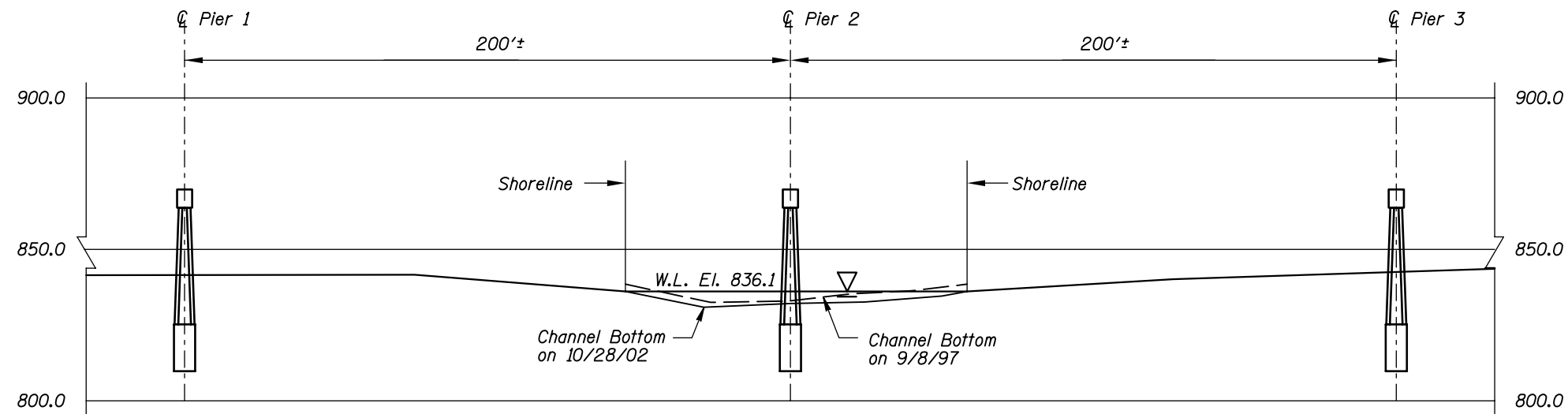
INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: OCT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 22550042		Figure No.: 1





UPSTREAM FASCIA PROFILE
Vertical Scale: 1"=50'-0"



DOWNSTREAM FASCIA PROFILE
Vertical Scale: 1"=50'-0"

Note:
Refer to Figure 1 for General Notes.

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 6676
OVER THE RED RIVER OF THE NORTH
DISTRICT 2, NORMAN COUNTY

**UPSTREAM AND DOWNSTREAM
FASCIA PROFILES**

Drawn By: PRH
Checked By: MDK
Code: 35I20042



COLLINS ENGINEERS, INC.
300 W. WASHINGTON, STE. 600
CHICAGO, ILLINOIS 60606
(312) 704-9300

Date: OCT. 2002
Scale: NTS (U.O.N.)
Figure No.: 2



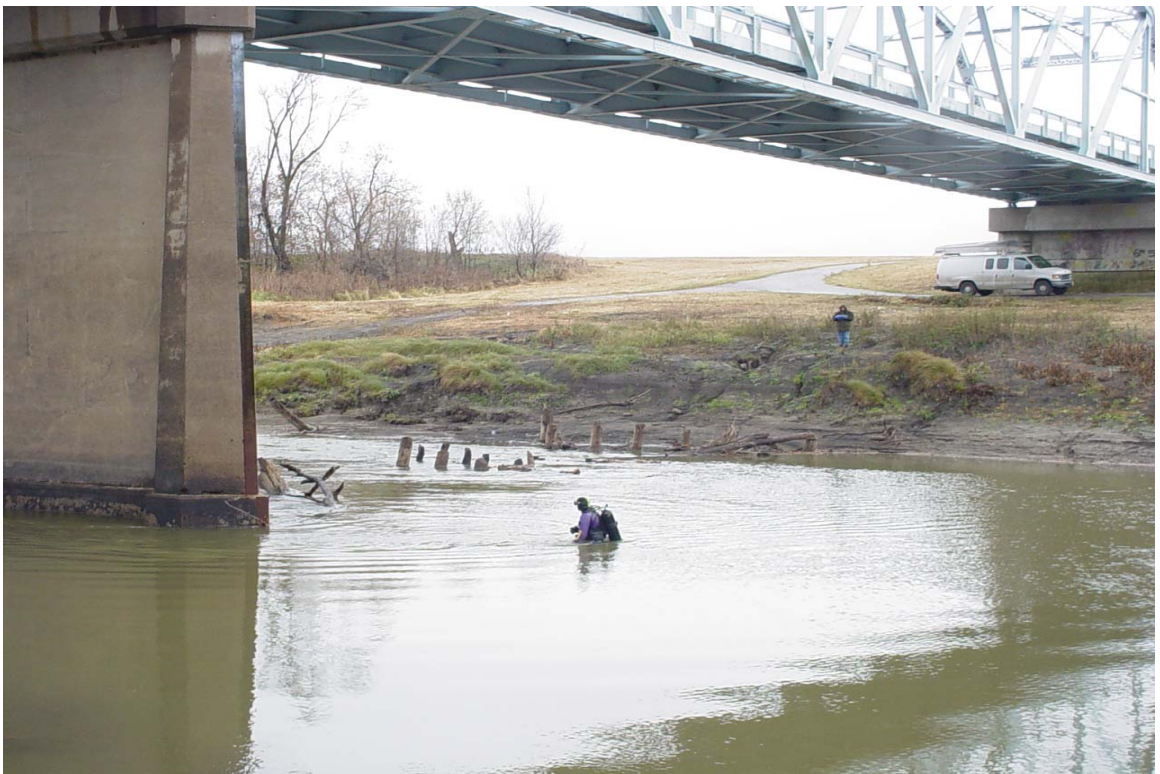
Photograph 1. Overall View of the Structure, Looking West.



Photograph 2. Overall View of the West Bank, Looking Northwest.



Photograph 3. Overall View of Pier 2, Looking East.



Photograph 4. Overall View of the East Bank, Looking Northeast.



Photograph 5. View of the Timber Debris at the Upstream Nose of Pier 2, Looking West.



Photograph 6. View of the Abandoned Timber Piles Along the East Bank, Looking Northwest.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 28, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 6676 WEATHER: Rain and Snow, " 35° F
WATERWAY CROSSED: The Red River over the North
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER

PERSONNEL: Clayton G. Brookins, Michelle D. Koerbel
EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera
TIME IN WATER: 12:15 P.M.
TIME OUT OF WATER: 12:55 P.M.
WATERWAY DATA: VELOCITY " 3 f.p.s.
VISIBILITY " 0.5 foot
DEPTH 7.0 feet maximum at Pier 2

ELEMENTS INSPECTED: Pier 2

REMARKS: The concrete surfaces were sound and in good condition with no structurally significant defects observed. A moderate accumulation of timber debris was observed at the upstream nose, along the east face, and around the downstream nose of the pier. In addition, there was timber debris hung up on and scattered throughout abandoned timber piles between the pier and the east shore. A 1.5-foot-diameter log was also observed along the west face of the pier. The channel bottom appeared stable with no appreciable changes since the previous inspection. The upstream and downstream banks on the east side were heavily eroded as noted in the previous inspection.

FURTHER ACTION NEEDED: X YES NO

Ideally, both the moderate accumulation of timber debris located around Pier 2 and the abandoned timber piles should be removed. In addition, consideration could be given to cutting down the abandoned piles to prevent future accumulations. Until removal operations are accomplished, future inspections should particularly monitor the drift accumulations.

FURTHER ACTION NEEDED: (CONTINUED)

Design plans with footing information for Pier 2 should be obtained, if possible, for the next underwater inspection.

Reinspect the submerged substructure unit at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 6676
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Red River of the North

INSPECTION DATE October 28, 2002
NOTE: USE ALL APPLICABLE CONDITION
DEFINITIONS AS DEFINED IN THE MINNESOTA
RECORDING AND CODING GUIDE INCLUDING
GENERAL, SUBSTRUCTURE, CHANNEL AND
PROTECTION, AND CULVERTS AND WALL
DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 2	7.0'	N	7	N	9	N	8	7	5	N	6	5	7	N	N	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: The concrete surfaces were sound and in good condition with no structurally significant defects observed. A moderate accumulation of timber debris was observed at the upstream nose, along the east face, and around the downstream nose of the pier. In addition, there was timber debris hung up on and scattered throughout abandoned timber piles between the pier and the east shore. A 1.5-foot-diameter log was also observed along the west face of the pier. The channel bottom appeared stable with no appreciable changes since the previous inspection. The upstream and downstream banks on the east side were heavily eroded as noted in the previous inspection.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.